

# ADVANTAGES OF COMMENSALISM IN *ULOBORUS FEROKUS* BRADOO (ARANEAE: ULOBORIDAE)<sup>1</sup>

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(With three plates containing six figures)

The paper gives an account of commensalism among spiders, and its advantage to a non-poisonous spider *Uloborus ferokus* Bradoo (Araneae: Uloboridae), which lives as a gregarious commensal on the web sheets of the social spider *Stegodyphus sarasinorum* Karsch (Family Eresidae).

## INTRODUCTION

The commensalistic association among spiders has received very little attention. The information available in the literature is based on some general observations, giving records of the association of one species with another. The actual biotic relationship involved between the two species has not been thoroughly investigated. The detailed study on the life-history and biology of commensal spiders forms an interesting and valuable field of arachnid ecology.

The various aspects of the biology of *Uloborus ferokus*, a gregarious commensal that lives on the web sheets of the social spider *Stegodyphus sarasinorum* have previously been described (Bradoo 1972a, 1979, 1985; Patel & Bradoo 1981). Studies on the ecology and behaviour of its host has also been reported earlier (Bradoo 1972b, 1975a, 1975b, 1980).

This paper gives an account of the various benefits and advantages that *U. ferokus* derives from commensalistic association with the social spiders.

## METHODS OF STUDY

The observations recorded here are based on extensive field studies and laboratory observations on these spiders. Nests of *S. sarasinorum* bearing these commensals were collected from

the field and installed near the laboratory, for experimentation and observations. For detailed techniques, previous publications by the author should be consulted.

## COMMENSALISM AMONG SPIDERS

Details and reviews on commensalism among spiders are not available, except for a brief note by Kaston (1965). Because of the insufficient observations, some species of spiders have often been recorded as parasites in a host web, and as commensals in the webs of some other spiders. Kullmann (1959) cites several authors like Comstock, Kukenthal and Vinson, who reported commensalism among a few spiders. However, true commensalistic association among spiders is rare, and so far known from only three different families, namely Oonopidae, Theridiidae and Uloboridae.

Under the family Oonopidae, Bristowe (1958) records that *Oonops pulcher* lives among the retreat fibres of the large spiders like *Amaurobius ferox* and *Tegenaria atrica*, and feeds on the remains of its host's meals.

Under the family Theridiidae, Simon (1894) reported *Theridion nodiferum* in commensalistic association with the tropical psachrids. The best known account of commensalism has been given by Exline (1945) for the conopisthine spiders that live on the webs of other spiders. She found 23 individuals of three different species of *Argyrodes* in the webs of different species of *Gastracantha*. Yaginuma (1956) reported *Rhomphaea sagana* and *R. fictilium*, in commensalistic association

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with the webs of *Linyphia*, *Araneus* and *Fontinella*, in Japan. Lamore (1957) found *Conopistha trigona* as a commensal of *Allepeira lemniscata*, in Maryland, U.S.A.

Legendre (1960) reports that one or many commensals may be found on the same host web, and he found upto 50 individuals of *Conopistha zonatus* in a single host web. Tembe and Thakur (1960) found specimens of *Argyrodes nephilae* in similar association with *Nephila maculata*, from India. This commensal feeds on very minute insects that do not attract the attention of the host spider. Bradoo (1983) recorded *A. progiles* in association with *Stegodyphus sarasinorum*, from Kerala.

Exline and Levi (1962) reported that some, perhaps all, the species of the genus *Argyrodes* live as commensals in the webs of larger spiders like *Nephila*, *Gastracantha*, *Argiope*, *Latrodectus*, *Agelenopsis* and *Allepiera*. Often, many individuals of different species of *Argyrodes* live on a single host web and feed on small insects that get ensnared in the host web. Hence, these small commensals may not construct any web of their own, or may sometimes construct a typical theridiid web consisting of only a few silk lines, close to or on the host web itself. These commensals hang in the host web upside down, with the first pair of legs folded beneath the body. They are usually inconspicuous, being smaller than the host and resemble some seeds, bits of bark or some plant matter attached to the host web. It is believed that conopisthine spiders may live in any convenient web as commensals.

The commensalistic association and nature of *Conopistha* has been questioned by Wiehle (1928), Thomas (1953) and Kullmann (1959) who consider that *Conopistha* is an obligate parasite, because it feeds on the prey that could be used by the host spiders also. Kullmann (1959) further points out that *C. argyrodes* steals wrapped prey held in reserve in the web by the host spiders like *Zygiella x-notata* and *Cyrtophora citricola*. Kullmann (1960a, b) found that *Theridion tepidarium* lives as a parasite in the web of *Cyrtophora citricola*. The observations of Dar-

chen (1965) are interesting in that he found that *Cyrtophora* species in Gabon steal captured insects from other orbs of larger spiders. Vollroth (1979) describes the behaviour of the kleptoparasitic spider *Argyrodes elevatus* from Panama.

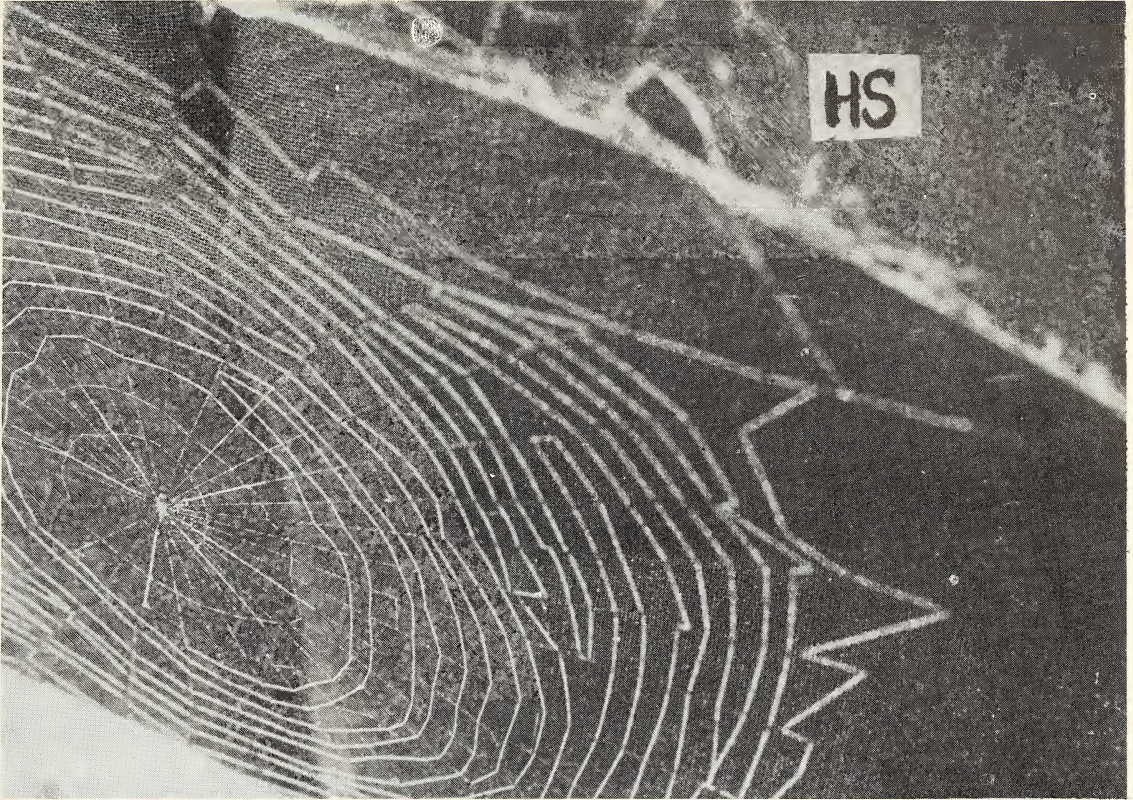
Kaston (1965) is of the opinion that the variation in the behaviour of conopisthine spiders is possibly due to their non-host specificity, and hence their behaviour seems to be so plastic and variable that in one host, they behave as a commensal, and in another they lead the life of a parasite. These observations may, however, help in understanding the origin of aggregations, commensalism, kleptoparasitism and true parasitism among spiders that are basically aggressive and cannibalistic.

Under the family Uloboridae, Simon (1892) reported *Uloborus servulus*, in commensalistic association with a *Cyrtophora* sp. in Venezuela. Gravely (1915, 1921) found a *Uloborus* species (unidentified) in commensalistic association with the social spiders, at Cochin, and recorded other unnamed species of these spiders from the webs of *Cyrtophora cicatrosa*, *Gastracantha brevespina* and *Nilus* sp., from Barkuda Island, and from the webs of *C. citricola*, from Burma.

Struhsaker (1969) reported *U. mundior* in association with the larger spiders like *Nephila clavipes*, in Panama. Opell (1979) reported colonies of *Philoponella tingena* in the webs of *Achaearaneae*, *Scytodes* and *Nephila*, in Panama and Colombia. Bradoo (1979) reported *U. ferokus*, a gregarious commensal that lives on the web sheets of *Stegodyphus sarasinorum*, in Kerala. This association serves many benefits and advantages to the commensal, but not at the expense of the host spiders. The host spiders are not at all harmed or affected in any way by the commensals, which are of very small size.

#### ADVANTAGES OF COMMENSALISM

**1. Support and protection:** *Uloborus ferokus* is a gregarious, non-poisonous, orb making spider. Its orb webs are supported by the host web sheets or are made between the host nest and the adjacent

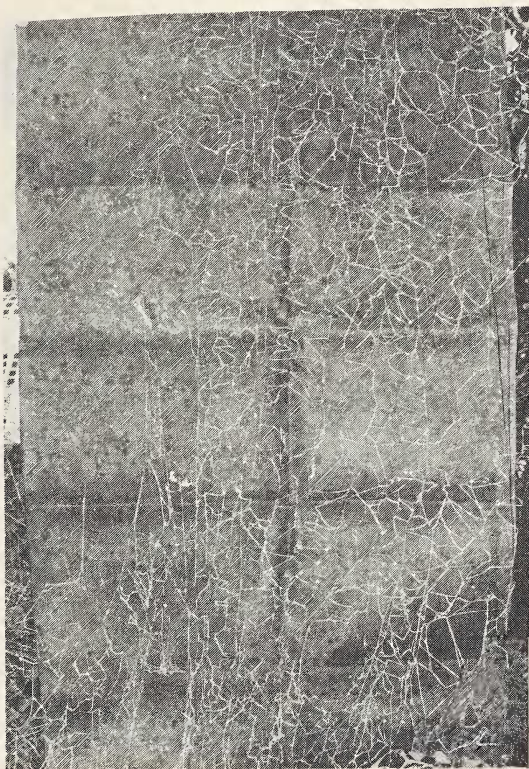


Above: An orb web of *Uloborus ferokus*, supported by the host silk threads (HS).  
Below: Orbs of the commensal as seen in the damaged areas of the host web.



Above: The *U. ferokus* female with her cocoon.

Below: The nest and the damaged web sheet with a host spider.



*Left* : Close-up of freshly made host web sheets showing sticky, zig-zag cribellar threads.

*Right* : A typical host nest with reduced web sheets during the breeding season of the host spiders. The nest shows interconnected tunnels inside.

